UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,522	09/09/2003	Maxime Moreno	SP02-197	4714

22928 7590 02/10/2009
CORNING INCORPORATED
SP-TI-3-1
CORNING, NY 14831

EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
02/10/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/659,522	MORENO ET AL.	
	Examiner	Art Unit	
	JENNIFER A. LEUNG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 11-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4 and 14-17* is/are rejected.

7)☒ Claim(s) *1 and 11-14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on November 10, 2008 has been carefully considered. Claims 3 and 5-10 are cancelled. Claims 1, 2, 4 and 11-17 are under consideration.

Claim Objections

2. Claim 1 is objected to because "arrange" (line 14) should be changed to --arranged--. Appropriate correction is required.

3. Claim 14 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The claim limitation is the same as the limitation now set forth in claim 1, lines 8-9. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (JP 09-085075) in view of Swift et al. (US 4,670,404).

Regarding claims 1 and 14, Suzuki et al. (see, e.g., FIG 5; see Abstract and full Machine Translation) discloses a chemical process apparatus comprising: a pressure vessel (i.e., a pressure resistant container **1**); a reactor (i.e., a reaction container **2**) disposed within the pressure vessel; wherein the pressure vessel is constructed and arranged to maintain the pressure vessel and the reactor at an elevated pressure when a chemical operation is performed within the apparatus; wherein the reactor **2** comprises a material such as ceramic, a polymer such as plastic, or a metal such as nickel alloy, iron alloy or carbon steel, depending on use (see section [0005]); wherein the apparatus further comprises a heat conductive medium communicating with the reactor **2** and arranged and positioned so as to be capable of providing thermal exchange between the reactor and the pressure vessel **1** (i.e., a gas or fluid pressure medium **E**, such as air, water or oil, may be introduced to the cavity part **B**. This medium will inherently function as a thermal exchange medium for transferring and conducting heat from the reactor **2** wall to the pressure vessel **1** during use; see section [0015]); wherein the apparatus further comprises an inlet line **51** passing through the pressure vessel wall, the inlet line **51** positioned and arranged so as to be able to introduce one or more fluids to be processed into the reactor **2** (see FIG. 5); and an outlet line **53** passing through the pressure vessel wall, the outlet line **53** positioned and arranged so as to be able to remove one or more processed fluids from the reactor **2** (see FIG. 5), whereby continuous processing of the fluids at high pressures may be achieved. Suzuki et al. also discloses that the medium **E** is pressurized within the volume **B** of the pressure vessel **1**, in order to maintain the volume **B** and the volume **A** within the reactor **2** at substantially the same pressure (see FIG. 5). Thus, the medium **E** inherently acts as support for the walls of the reactor, by counteracting the outward pressure on walls of the reactor when its contents are pressurized.

Suzuki et al., however, is silent as to the reactor **2** comprising a microreactor.

Swift et al. (see FIG. 1; column 5, lines 1-59) teaches a pressure vessel (i.e., containment unit **12**, with sidewall **102** and top **104**) and a micro-scale reactor (i.e., test vessel **10**) disposed within the pressure vessel. It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the reactor **2** in the apparatus of Suzuki et al. as a micro-scale reactor, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the micro-scale would allow for the safe simulation of full-scale chemical processes prior to full-scale implementation, as taught by Swift et al. Also, it has been held that changes in size involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955).

Regarding claim 2, an autoclave, by definition, is a vessel used for conducting chemical reaction under high pressure. Thus, the vessel **1** of Suzuki et al. meets the claim.

Regarding claim 15, Suzuki et al. discloses that the reactor **2** may be constructed of a heat conductive material, e.g., a metal such as a nickel alloy, an iron alloy, or carbon steel. Similarly, the pressure vessel **1** may be constructed of a heat conductive material, e.g., a metal such as carbon steel or stainless steel (see section [0005]). Also, the medium **E** provided within the volume **B** may comprise a heat conductive material, such as water or oil (see section [0015]). Thus, the modified apparatus of Suzuki et al. is structurally capable of achieving temperature control, by controlling the temperature of the pressure vessel **1** rather than by directly controlling the temperature of the reactor **2** itself, since each of the materials of the apparatus are inherently capable of conducting heat.

Regarding claims 16 and 17, Suzuki et al. further discloses that the inlet line may be

positioned and arranged so as to be capable of introducing into the volume **B** surrounding the reactor within the vessel, a fluid to be processed (see, e.g., line **21** in FIG. 2; line **32** in FIG. 3; line **42** in FIG. 4). Suzuki et al. also discloses that the outline line may be positioned and arranged so as to be capable of withdrawing from the volume **B** surrounding the reactor within the vessel, a processed fluid (see, e.g., line **24** in FIG. 2). In each case, the fluid supplied to the volume **B** inherently functions as a heat conductive medium, capable of transferring heat from the reactor **2** wall to the pressure vessel **1**.

5. Claims 1, 2, 4, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ota et al. (JP 2002-186844) in view of Swift et al. (US 4,670,404).

Regarding claims 1, 4 and 14, Ota et al. discloses an apparatus (i.e., a high-temperature-high-pressure reaction apparatus **A1**; see, e.g., FIGs. 1, 2; Abstract; Machine Translation) comprising: a pressure vessel (i.e., pressure resisting container **2**) and a reactor (i.e., reaction vessel **1**) disposed within the pressure vessel; the pressure vessel **2** being constructed and arranged to maintain the pressure vessel and the reactor at an elevated pressure during operation; the reactor comprising a metal material such as stainless steel (see, e.g., section [0029]); wherein the apparatus further comprises a heat conductive medium (i.e., an adiabatic wall **5** comprising, e.g., SiC material, see section [0024]; with a supercritical fluid filling the opening S) supporting the reactor **1** within the pressure vessel **2**, arranged and positioned so as to be capable of providing thermal exchange between the reactor **1** and the pressure vessel **2**; wherein the apparatus further comprises an inlet line (i.e., in communication with supply **12**, **13** or **14**) passing through the pressure vessel **2** wall, the inlet line positioned and arranged so as to be able to introduce one or more fluids to be processed into the reactor; and an outlet line (i.e., in

communication with fluid exhaust **15**) passing through the pressure vessel **2** wall, the outlet line positioned and arranged so as to be able to remove one or more processed fluids from the reactor.

The apparatus of Ota et al. is the same as the claimed apparatus, except that Ota et al. is silent as to the reactor **1** comprising a microreactor.

Swift et al. (see FIG. 1; column 5, lines 1-59) teaches a pressure vessel (i.e., containment unit **12**, with sidewall **102** and top **104**) and a micro-scale reactor (i.e., test vessel **10**) disposed within the pressure vessel. It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the reactor **1** in the apparatus of Ota et al. as a micro-scale reactor, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the micro-scale would allow for the safe simulation of full-scale chemical processes prior to full-scale implementation, as taught by Swift et al. Furthermore, it has been held that changes in size involve only ordinary skill in the art.

Regarding claim 2, an autoclave, by definition, is a vessel used for conducting chemical reaction under high pressure. Thus, the pressure vessel **2** of Ota et al. meets the claim.

Regarding claim 15, Ota et al. discloses that temperature control for the reactor **1** can be achieved by controlling the temperature of the pressure vessel **2**, rather than directly controlling the temperature of the reactor **1** itself (i.e., the temperature may be controlled by means of an external heater **6** disposed on the pressure vessel; FIGs. 1, 2; sections [0030], [0031]).

Allowable Subject Matter

6. Claims 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose or adequately suggest a chemical

processing apparatus comprising a pressure vessel and a microreactor disposed within the pressure vessel, the apparatus including inlet and outlet lines for enabling continuous processing of reactants within the microreactor; wherein a heat conductive material comprising SiC in particulate form supports the microreactor within the pressure vessel, and is arranged and positioned to provide thermal exchange between the microreactor and the pressure vessel.

Response to Arguments

7. Applicant's arguments filed on November 10, 2008, with respect to the rejection of claims 1, 2, 16 and 17 under 35 U.S.C. 102(b) as being anticipated by Schutte and the rejection of claims 4 and 11-13 under 35 U.S.C. 103(a) as being unpatentable over Schutte in view of Kawaii, have been fully considered. The rejections have been withdrawn in view of Applicant's amendment to claim 1 and the corresponding arguments.

8. Applicant's arguments filed on November 10, 2008, with respect to the rejection of claims 1, 2 and 14-17 under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Swift, have been fully considered but they are not persuasive. Applicant (at page 5, last two paragraphs) argues,

> "... neither Suzuki nor Swift teaches or suggests a heat conductive medium supporting the microreactor within the pressure vessel, as taught and shown in the present application. For argument's sake it may be assumed, as stated by the Examiner in the current Action, that "the medium E [of Suzuki] inherently acts as support for the walls of the reactor." However, the claim recites that the "microreactor" is supported "within the pressure vessel" by the recited medium, not that the walls of the microreactor are supported by said medium.
>
> Supporting the microreactor walls against an internal pressure is not the same as supporting the microreactor itself. The plain meaning of supporting the microreactor within the pressure vessel is bearing the weight of the microreactor or maintaining its

position within and relative to the pressure vessel. Suzuki thus does not teach a heat conductive medium supporting the microreactor as recited in the claim. Swift adds nothing on this point."

The Examiner respectfully disagrees.

According to the Random House Dictionary, 2006 (taken from www.dictionary.com), a definition of "support" is, for example,

2. to sustain or withstand (weight, pressure, strain, etc.) without giving way; serve as a prop for.

The medium E in Suzuki meets this definition, because its function is to sustain or withstand the pressure of the reactor. Also, because the walls of the reactor are considered part of the reactor, the heat conductive medium thus supports the reactor.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. In particular, Applicant's amendment incorporated the limitations from claim 14 into claim 1. This changed the scope of the claims which previously depended from claim 1, but not claim 14. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. LEUNG whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A. Leung/
Primary Examiner, Art Unit 1797